

No Park is an Island

WHEN YOU THINK OF ISLE ROYALE NATIONAL PARK, WHAT comes to mind? It’s likely that words like “remote,” “unspoiled,” “pristine,” or “isolated” are the first adjectives you think of. Isle Royale is remote, and in many ways is as close to pristine as some park systems get. It is much more closely tied to the environment around it than it may appear, however. Therein lie some of its greatest challenges.

Ongoing studies at Isle Royale have shown that the park is vulnerable to the consequences of activities far beyond its borders, such as air pollution from sources located hundreds of miles away. Elevated mercury levels have been documented in the food chain at the park, in plant communities, in fish in the park’s inland lakes, and in the teeth of moose (whose diet consists of island vegetation).

Another difficult challenge for Isle Royale is the ongoing fight against non-native, invasive species. This constitutes one of the biggest challenges because even though the park is not as susceptible as its mainland counterparts to terrestrial invaders, it is very vulnerable to aquatic invasive species. The Great Lakes has been and will continue to be a major transportation route for ships from around the world. The introduction of non-native species via international shipping will always be a threat to native species in these waters. On a more immediate level, many of these non-natives can “hitch a ride” with unsuspecting boaters out to Isle Royale (including on the park’s own boats!). Because of the isolated nature of island environments, there isn’t much ability for native species’ populations to “bounce back” if there is an invasion.

Two of the most troubling aquatic invasive exotic species are the zebra mussel and the spiny water flea. Most people in the Great Lakes area are now familiar with zebra mussels. At Isle Royale, it appears that zebra mussels have not yet become established. We’re trying to figure out why, and at the same time take more precautions to prevent them from getting a foothold here. The spiny water flea is already in the Lake Superior waters within the park boundaries. This little invertebrate has been shown to disrupt naturally-occurring zooplankton communities (the basic food source for many

fish species), and may cause direct harm to some fish species that try to eat them, due to their large spines.

Both the zebra mussel and the spiny water flea could also threaten the park’s native mussel population. (Isle Royale is one of the few places left on the Great Lakes that has native mussels.) While this may not sound like much cause for alarm, when it is put in the proper context, it’s downright frightening: mussels are filter-feeders, and they directly impact aspects of freshwater systems like water quality and the aquatic food chain. The Great Lakes historically hosted huge populations of native mussels, but pollution and invasive species have reduced species and numbers down to a tiny fraction of what they once were. No one knows the long-term impacts to the Great Lakes freshwater system that will result from their loss.

At Isle Royale, we are trying to do what we can to meet these challenges, and we count on our visitors to help us. We continue to try to learn more about the biology of invasive species, and use this knowledge against them. We focus on monitoring systems like the park’s Lake Superior waters and our inland lakes, to see if new invasive species show up and to learn more about the natural defenses of our native plants and animals. We share our research results with other parks and resource management agencies that may be facing the same battles. We also get the word out to the public, through the Greenstone, and through our rangers, to let you know how you can make a difference. Your help is critical, from properly cleaning your gear to prevent transporting “aliens,” to talking to friends and family about invasive species and other natural resource issues.

This issue of the Greenstone explores some of the invasive species issues described above in more detail. In these pages, we’ll share what we’ve learned so far with you, and hopefully we will spark your interest to find out more about Isle Royale and its connection to the world around it. For better or worse, it really is a small world.

Jean Battle
Chief, Natural Resource Management Division

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Books and maps provided through the Isle Royale Natural History Association.



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800 East Lakeshore Drive
Houghton, MI 49931-1869
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www.irnha.org
E-mail:
irnha@irnha.org

Rock Harbor Lodge Summer
P. O. Box 605
Houghton, MI 49931-0605
Phone: 906-337-4993
Winter
Isle Royale Resorts, P. O. Box 27,
Mammoth Cave, KY 42259-0027
Phone: 270-773-2191
Website:
www.isleroyaleresort.com
E-mail:
isleroyaleresort@starband.net

Weather Forecasts for Isle Royale Michigan
www.crh.noaa.gov/mqt
Minnesota
www.crh.noaa.gov/dlh

National Weather Service Radio Forecasts

- 162.400 MHz from Houghton, Michigan.
- 162.475 MHz from Thunder Bay, Ontario, Canada.

Michigan's Keweenaw Tourism Council
Phone: 800-338-7982
Website:
www.keweenaw.info
E-mail: info@keweenaw.info

Minnesota's Grand Marais Visitor Information Center
Phone: 888-922-5000
Website:
www.grandmarais.com

Michigan Department of Natural Resources Fishing License Purchase:
Website:
www.michigan.gov/dnr

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- Photographs from the Isle Royale National Park collection.
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—Printed on recycled paper—

Did You Know?

- ◆ Lake Superior is the deepest, largest surface area, cleanest, clearest, and coldest of the Great Lakes.
- ◆ Although Lake Superior is by surface area the largest body of fresh water in the world, it has a low level of dissolved nutrients available to support aquatic life. As a result, the Lake Superior fishery produces only about 10% of what the nutrient rich waters of Lake Michigan produce annually.
- ◆ Forty-five species of fish inhabit Lake Superior, and 78 species inhabit Lake Michigan.
- ◆ Fourteen Lake Superior species are listed by Canada and the U.S. as endangered, threatened, or of special concern.
- ◆ Several alien species threaten Lake Superior's native fish. Some of the greatest threats are Sea Lamprey, Zebra Mussels, Round and Tubenose Gobies, Ruffe, White Perch, American Eel, Three-spine and four-spine Stickleback, Alewife, and two species of planktonic crustaceans with long spines.
- ◆ Of the exotic species that have become established in the Great Lakes, 55% are native to Eurasia and 13% to the Atlantic coast.
- ◆ In Minnesota's Duluth Harbor, zebra mussels are one of 31 invasive species that are affecting the ecological balance of 31 native fish species and 40 native mussel species.

Smitty Parratt
Branch Chief of Interpretation

Coaster Brook Trout Portrait

Name: Coaster Brook Trout
Species: *Salvelinus fontinalis*
Status: native and rare
Management: Protect and restore viability of Isle Royale populations
Description: tail fin slightly forked, light sides, olive-green back, and silvery white underside, hook at front of jaw in breeding males, pale red spots with blue halos on sides
Size: up to 18" long and 3 pounds
Life Span: up to 15 years
Habitat: Clear and cold streams, lakes, and ponds
Feeding Behavior: Tiny larval insects, small fish, and occasionally, field mice and snakes



Coaster Brook Trout Return Home

The afternoon of September 23, 2003 was cool and overcast. There was little fanfare as 52,200 coaster brook trout were silently released into Siskiwit Bay in Isle Royale National Park. Fish and Wildlife officers hope that these fingerlings will give new life to the remaining population in the bay.

At midnight the previous night, the fish had been loaded onto trucks from the Iron River and Genoa National Fish Hatcheries and transported to Houghton, Michigan. Early the next morning, their containers were hoisted onto the front deck of the National Park Service vessel *Ranger III*. Aeration and temperature were frequently monitored during the five-hour voyage. The young fingerlings endured 8 to 10 foot seas as the ship traveled 60 miles across the world's largest freshwater lake, to be released where their parents' lives began.

From the lower decks of the *Ranger III*, the National Park Service Regional Director and a handful of park employees and visitors crowded around windows and railings to witness the fish flowing into Lake Superior and immediately diving into its protective waters.

These fingerlings are the offspring of fish which were collected as eggs from island waters in 1995 and 1999. This was the fifth year in which Coaster Brook Trout have been stocked into Siskiwit Bay to ensure that a viable population will remain.

John Johnston
Fishery Biologist, U. S. Fish and Wildlife Service
Smitty Parratt
Chief of Interpretation



NPS and USFWS officials position coaster brook trout tanks



Coaster brook trout fry pour into Siskiwit Bay

Native Fish Communities: Protecting a Genetic Jewel From an Aquatic Invasion

Long before any human visited Isle Royale, fish communities were evolving in its frigid waters. These isolated waters developed a complex, genetically diverse fishery, which over the last 150 years has faced boom or bust commercial fishing, and a host of human-introduced invasive aquatic species.

It is speculated that after the recession of the glaciers, the island’s fish communities migrated from portions of the Midwest in the upper Mississippi drainage. Once arrived, geographic isolation helped these species change slowly and become distinct from their ancestors. Recent analysis of lake whitefish from Lakes Desor, Siskiwit, Superior, and Huron show that each lake’s whitefish are genetically distinct.

Geographically isolated, the island’s inland lakes have no influx of new genetic material. Studies suggest this will lead to a reduction in genetic diversity through inbreeding. The inland lake walleye on Isle Royale are less genetically diverse than those from Lake Erie or Lake St. Clair. Further studies in the Lake Superior basin are underway.

Lake Superior’s lake trout population is treasured by anglers and is one of the Park’s unique features. Isle Royale’s lake trout are the most genetically diverse in Lake Superior and are the best example of a rehabilitated population. Other populations around the lake have been heavily stocked with hatchery-raised lake trout; they exhibit a lower genetic diversity. After the commercial fisheries collapsed in the 1950’s, Isle Royale’s lake trout recovered quicker than near-shore Lake Superior populations due to remnant spawners and a well-timed sea lamprey control program.

The cold expanse of Lake Superior has for thousands of years helped preserve Isle Royale. The National Park Service for over 60 years has worked to preserve and protect the ecological integrity of Isle Royale’s ecosystem. Today we are faced with an onslaught of aquatic invasive species. Increased accessibility to Isle Royale’s waters has opened the door to these unwanted hitchhikers.

Invasive species like zebra mussels alter entire ecosystems with amazing speed. In just two years, they could cover nearly every living and non-living habitable surface on an Isle Royale inland lake floor. What if zebra mussels spread throughout the Park’s inland lakes? They would gobble up plankton and disrupt the food chains; native fish communities and freshwater mussels would be lost from the inland lakes forever.

Other invaders already here or approaching include: sea lamprey, Asian carp, spiny and fish hook waterfleas, ruffe, round goby, rusty crayfish, Eurasian milfoil, common reed, and quagga mussel. Non-native fishes, including rainbow/steelhead trout, brown trout, Chinook/king salmon, Coho salmon, pink salmon, rainbow smelt, alewife, and carp, compete for resources with the native fishes. These non-native fishes consume prey fish, eat native fish eggs, uproot and eat aquatic vegetation, feed on plankton, and take over optimal habitat. The combination of these stresses can be catastrophic on native fish populations.

Fortunately, it is easier to prevent establishment of exotics than control them once arrived. The Park is working with partners to address aquatic invaders and is currently developing a

Fish Management and Water Resources Management Plan. The Isle Royale Boaters Association has taken a lead in educating members and boaters at marinas on Minnesota’s North Shore. Research is fostered to better understand invasive species so we can prevent, or as a last resort, control them.

You can help preserve the Park’s native fish and water resources. As a boater, drain live well, bilge, bait well, and motor water from your boat; clean weeds off the motor and boat; if possible, dry your boat for 5 days before launching and departing for Isle Royale. Do not drain water from live wells, bilge, or other boat water brought from outside the park once you are in the Park (4-1/2 miles off-shore from park islands). Canoeists and kayakers, when fishing the inland lakes, be sure fishing lines are free of debris (especially waterfleas). Don’t dump Lake Superior water into inland lakes. These few steps will go a long way in preventing aquatic exotics from establishing and spreading in the Park.

Mark C. Romanski; Lead Biological Science Technician



Spiny Waterfleas foul fishing gear



Zebra Mussel Portrait

Common Name:

Zebra Mussel

Species: Dreissena polymorpha

Status: Alien

Management: They have severely reduced, and may eliminate, native mussel species in the Great Lakes. Therefore, management efforts strive to reduce their populations and stop them from spreading to new locations.

Description: Small, bivalve, triangular shaped mollusk with sharp edges. Usually alternating light and dark stripes but can be entirely light or dark.

Size: Shell length up to 1.5 inches in diameter.

Life Span: three to five years

Habitat: Almost any body of freshwater, they require temperatures above 54 degrees F to reproduce.

Feeding Behavior: filter plankton, removing this food source from native species

Isle Royale’s Wolf and Moose Populations

During its 45th year, the annual wolf/moose-predator/prey research and monitoring program, Winter Study, counted 19 wolves, up by two from 2002. The island remains divided into three wolf pack territories - the East Pack, Middle Pack, and the Chippewa Harbor pack. All three of the packs produced pups early in 2002. Seven survived into 2003, four in the Middle Pack, at least two in the Chippewa Harbor pack, and one in the East Pack. The Middle Pack is currently estimated at 7 individuals, the Chippewa Harbor pack at 6, and the East Pack at 3. Three additional wolves appeared to be loners.

The East Pack changed the most in 2003, losing 5 of its 6 members from 2002 to 2003. However, the remaining member, an alpha female, recruited a new alpha male from the Middle Pack and they had a pup. The Chippewa Harbor Pack continued pushing the East Pack into an increasingly smaller territory at the extreme east end of the island.

In February 2003, the Middle Pack killed an adult male who had dispersed from one

of the other packs. This wolf was in very good condition. Upon closer examination the researchers found that the pads on the middle toes of both its front paws were fused, but the bones underneath were normal. This could possibly be caused by the reduced gene flow that occurs in an island environment, where individuals in a species are isolated.

Isle Royale’s moose population dropped from 1,100 to 900 in 2003, and is composed of mostly young, strong animals (many born during and after 1997, following the huge 1996 moose die-off). Calf numbers remained low. The winter tick infestation, combined with a late spring arrival in 2002, may account for the population decrease in 2003. Moose didn’t appear to concentrate along the conifer-dominated shorelines, as they usually do, but instead remained in a fairly even distribution across the northeast and southwest ends of the island.

Snow depths were low through 2003, which generally allows moose to defend themselves and their calves against wolf

predation. This does not seem to have held true in 2003. Despite the low snow depths, 20 moose-kills were detected; this is at or above the long-term average for all three packs.

The annual Winter Study program contributes significantly to the research and survey work completed on the wolf and moose populations of Isle Royale. Results of the 2004 Winter Study effort were completed too late to be included in this edition of the Greenstone. Information for this report was taken from Petersons Ecological Studies of Wolves on Isle Royale, Annual Report 2002-2003. A summary of the current annual report can be found on-line by visiting Isle Royale National Park’s web page at www.nps.gov/isro. The full report can be purchased at the visitor centers or through the Isle Royale Natural History Association (see back page for information).

Jean Battle
Chief, Natural Resource
Management Division



Spiny Waterflea Portrait

Common Name: Spiny Waterflea

Species: Bythotrephes longimanus

Status: Alien

Management: Native to Eurasia, observed in Lake Ontario first in 1982. Compete with native fish for food and foul fishing gear. Management works to prevent their spread

Description: small predaceous crustacean that looks like bristly gobs of jelly with black spots

Size: Large individuals are just under 1/4 of an inch, making them visible to the naked eye.

Life Span: two to three weeks

Habitat: found in all of the Great Lakes and some freshwater lakes

Feeding Behavior: predaceous on herbivorous Crustacea



Interpretive Activities

Enjoyable and educational programs are offered on Isle Royale at Rock Harbor, Daisy Farm, and Windigo, and they are also presented on the National Park Service vessel, *Ranger III*. In addition, guided excursions explore such areas as

Passage Island and Lookout Louise near Rock Harbor. Ranger guided programs are free, although those involving the tour boat *MV Sandy* include a transportation fee. Check at local bulletin boards for further details. For outdoor activities, dress for the possibility of cold or rain and wear sturdy footwear. Trails are slippery and muddy during or after wet weather; wear shoes with good ankle support, weatherproofing, and soles that grip well. COME JOIN US!

Budget shortfalls have reduced staffing. Check at Park Visitor Centers for availability of educational programs.

- All times are Eastern Daylight Time
- \$ = transportation cost
- ** = indicates tours with a park ranger

ROCK HARBOR AREA	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Rock Harbor Visitor Center Information, books, maps, & other educational sales materials, camping permits, user fees.			Daily 8:00 a.m. to 8:00 p.m.				
Evening Program Learn about Isle Royale’s natural and cultural history.			May be offered 8:00 p.m. to 9:00 p.m.; check at the Visitor Center for availability and location.				
Nature Walk Take a leisurely stroll with a ranger at Rock Harbor to learn about Isle Royale’s natural or cultural history.	May be offered on days when the <i>Isle Royale Queen III</i> comes to Rock Harbor; check local bulletin boards.						
MV SANDY TOURS FROM ROCK HARBOR	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
The trails on guided tours are rocky and uneven with some steep climbs and descents; trails may be slippery. Be prepared for cold temperatures and the possibility of rain. If stormy weather cancels the boat trip, an alternate guided hike is offered.	For all tours and programs involving the <i>MV Sandy</i> , obtain tickets and information at the Lodge Registration Office. <i>MV Sandy</i> Tours will operate from June 8 through September 10. Fare rates for the various tours are available at the Rock Harbor Lodge and Rock Harbor Visitor Center; children under 12 are charged half-price for the <i>MV Sandy</i> .						

Hidden Lake/Lookout Louise (\$)** Greenstone Shuttle A 4-mile boat trip on the <i>MV Sandy</i> to Hidden Lake Trailhead followed by a guided 2-mile round trip hike past Hidden Lake up 320 feet to Lookout Louise. View Ontario and the north shore of Isle Royale. Return with the group or bring a lunch and water and hike 10.2 miles back to Rock Harbor.			9:00 a.m. to 12:30 p.m.		9:00 a.m. to 12:30 p.m.		
Passage Island (\$)** An 8-mile boat tour on the <i>MV Sandy</i> to the island across one of Isle Royale’s popular shipping lanes followed by a guided 2-mile round trip walk to the Passage Island Lighthouse. You’ll see the rare devils club, an isolated glacial relic.		1:30 p.m. to 6:00 p.m.				1:30 p.m. to 6:00 p.m.	
North Side Cruise/Minong Mine (\$) Cruise two hours each way along Isle Royale’s north shore bays. Pass Blake Point and Amygdaloid Island, with a possible stop at Belle Isle. A guide may be available to lead a 3-mile guided hike from McCargoe Cove to the historic Minong Mine. The hike includes difficult walking over steep piles of loose rock on an unmaintained trail. A side trip up the ridge to Pine Mountain, with excellent views of the Canada shoreline, may be included. Bring lunch and beverage.				9:00 a.m. to 5:30 p.m.			
Edisen Fishery and Rock Harbor Light (\$) Visit a historic commercial fishery with the resident fishery demonstrator and take a quarter-mile walk to the oldest lighthouse (1855) on Isle Royale.					2:00 p.m. to 6:00 p.m.		9:00 a.m. to 1:30 p.m.
Captain’s Cruise (\$) Explore with the Captain of the <i>MV Sandy</i> scenic, out-of-the-way destinations, such as Middle Island Passage, Lorelei Lane, Rock Harbor Lighthouse, Davidson Island, and Starvation Point.			2:00 p.m. to 5:30 p.m.				

Raspberry Island/Sunset Cruise (\$) Take a walk along a boardwalk through the spruce bog on Raspberry Island followed by a cruise on the <i>MV Sandy</i> around Scoville and Blake Points to view features like the Canada shorline, the site of the Monarch shipwreck, and a Lake Superior sunset (after Aug. 15, cruise only)							
			8:00 p.m. to Sunset in June-July 7:30 p.m. to Sunset in August-September				

DAISY FARM	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Check for availability of evening programs at the campground bulletin board. Learn about Isle Royale’s natural and cultural history at the site of a historic settlement.				May be offered 7:30 p.m. to 8:30 p.m.			May be offered 7:30 p.m. to 8:30 p.m.
WINDIGO	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Windigo Visitor Center Information, books, maps, and other educational sales materials, camping permits, user fee payments.			Daily 8:00 a.m. to 6:00 p.m.				
Evening Program Learn about Isle Royale’s natural and cultural history.			May be offered 7:30 p.m. to 8:30 p.m.; check at Visitor Center for meeting place.				
Nature Walk Join a ranger for a one-mile stroll through swamp, forest, and past a moose enclosure.			Check for availability at Visitor Center.				
Windigo Whispers Join a ranger to explore special topics relating to Windigo’s natural or cultural history.			Check for availability at Visitor Center.				

HOUGHTON	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Houghton Visitor Center Information, books, maps, and other educational sales materials, <i>Ranger III</i> and group camping reservations, trip planning, boater camping permits, and user fee payments.	Open year-round, except for fall and winter holidays, 8:00 a.m. to 4:30 p.m. Monday through Friday 6/14 through 8/21 open 8:00 a.m. to 6:00 p.m. Monday through Friday. Saturday 10:00 a.m. to 6:00 p.m. 8/23 through 9/11 open 8:00 a.m. to 4:30 p.m. Monday through Friday, Saturday 10:00 a.m. to 4:30 p.m.						

RANGER III	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Maritime Program (\$) Isle Royale Institute and park staff present educational and interpretive programs about Isle Royale and Lake Superior onboard the <i>Ranger III</i> , weather permitting. Park staff can assist you in trip planning, answer questions and issue backcountry camping permits.			9:00 a.m. to 3:00 p.m. 6/1 thru 9/7	9:00 a.m. to 3:00 p.m. 6/2 through 9/8		9:00 a.m. to 3:00 p.m. 6/4 thru 9/10	9:00 a.m. to 3:00 p.m. 6/5 through 9/11

JUNIOR RANGER PROGRAM							
	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Children 6 to 12 years old can participate in the Junior Ranger Program. Check at any Isle Royale National Park Visitor Center for details. Children can graduate in one full day and receive a badge and certificate.		Available daily Rock Harbor and Windigo. Available Tuesdays, Wednesdays, Fridays, and Saturdays aboard the <i>Ranger III</i> vessel.					

Wilderness Use

During Isle Royale’s early history, visitors risked much to get there. They did not come to vacation; they came to tame the wilderness through mining its copper, harvesting its fish and logging. The island was never tamed, the resource never conquered, but its landscape holds the scars of these early attempts. Today Isle Royale has reverted back to a primitive wilderness. The environmental conditions historically viewed as a burden are now attracting a new clientele. Today’s visitors, as in the past, can still adversely affect this sensitive resource. To minimize your impact on park resources and other visitors please practice “Leave No Trace” principles (for more information visit the Leave No Trace website at www.lnt.org). Where you place your feet is as important as how you treat and dispose of waste. Be part of the solution: help maintain the sense of solitude and preserve the wilderness flavor, a flavor that has the potential to change your life. Proper wilderness use begins with reading, supporting, and putting into practice the following information.

Camping

Permits are required for all overnight stays at campgrounds, cross-country sites, docks, or at anchor, regardless of group size or method of travel.

Party Size Defined

The party size for camping at Isle Royale is divided into two categories. “Individual” parties are defined as a group of six or less people. “Group” parties are defined as seven to ten people. There are different requirements outlined below based on party size.

Individual Camping Permits — parties of six or less

Camping for individual parties is on a first-come, first-serve basis. Individual parties can obtain permits onboard the *Ranger III* or upon arrival at Rock Harbor or Windigo Visitor Centers. For trip planning assistance, call (906) 482-0984; write to Isle Royale National Park, 800 East Lakeshore Drive, Houghton, Michigan 49931, or E-mail ISRO_ParkInfo@nps.gov.

Group Camping Permits — parties of seven to ten

Advance reservations are required for group camping. For reservations and trip planning assistance call (906) 482-0984; write to Group Reservations, Isle Royale National Park, 800 East Lakeshore Drive, Houghton, Michigan 49931, or E-mail ISRO_GroupReserve@nps.gov. If your party exceeds ten people, you must split into two groups, each independent and traveling on completely separate itineraries. Groups shall camp in group tent site locations only (see chart on page six). Group leaders shall carry medical information for each group member including known allergies, known medical conditions, and medications currently taken. Organizations may not have more than twenty people camping on the island at any one time.

Where to Camp

All campsites on Isle Royale offer tent sites and/or three-sided shelters. Shelter and tent sites are available on a first-come, first-served basis. Shelters may not be reserved and may not be used solely for cooking or storage of gear. Tents may not be erected at shelter sites. Be gentle with screen doors on shelters to minimize intrusive noise and to prevent damage.

Expect crowded conditions at park campsites during mid-July through August. When sites are full, we ask campers to double up and share empty tent pad space.

Campers must stay in established campsites unless off-trail (cross-country) arrangements are made at the time the permit is obtained. Off-trail hiking and camping is difficult at Isle Royale, and is only recommended for experienced campers.

Commercial Groups

Organizations that charge trip participants a fee or that compensate members or trip leaders in any way are commercial groups under federal law. This applies to both non-profit and for-profit organizations. Commercial groups must apply for and receive an Incidental Business Permit (IBP) to conduct trips in the park. There is a fee for this permit. IBP applications are only accepted between January 1 and May 15; contact the park’s Chief Ranger’s Office at (906) 487-7148.

“Quiet, Please”

Most visitors come to Isle Royale to hear the sounds of nature in a wild setting. Excessive human noise disturbs wildlife and other visitors. Sound travels easily over the water and on the trail. During quiet hours, between 10:00 p.m. and 6:00 a.m. EDT, if people in adjacent campsites can hear your activities, you are being too loud.

Respect Wildlife

Observe, photograph, and enjoy park wildlife from a safe distance. Use binoculars or zoom lens “to get closer” to wildlife. If animals flee, become defensive, or change their natural activities in your presence, you are too close! Loons are especially susceptible to disturbance, and may abandon their nests when approached too closely by boats. Cow moose with calves, particularly in the spring, and bull moose during the fall rut can be dangerous; give them a wide berth. It is illegal to feed, touch, tease, or intentionally disturb wildlife, their homes, nests, or activities. Animals, particularly fox and otter, when habituated to human food, may eventually overcome their natural wariness of humans and may have to be destroyed.

Human Waste

Proper disposal of human waste helps prevent pollution of water sources, minimizes aesthetic impacts to other visitors and reduces the spread of illness. Never defecate or urinate within 100’ of lakes, streams, trails, or campsites. Use outhouses where available. In areas without outhouses, select a site that visitors are unlikely to discover. With a small trowel, dig a “cathole” 6 to 8 inches deep and 4 to 6 inches in diameter. Place used toilet paper and fecal material in the hole. Use toilet paper sparingly. After use, cover the “cathole” with the excavated soil and disguise it with natural materials. Urinate on durable surfaces, such as rocks, sand, or gravel. Try to avoid urinating on green plants. Pack out all used feminine-hygiene products in plastic bags, doubled to confine odor.

Showers

The concession operation offers token-operated shower facilities at Rock Harbor (5/28 – 9/10) and Windigo (6/8 – 9/12). In the backcountry, use biodegradable soap and bathe 100’ or more from any water body.

Drinking Water

Potable water is only available at Rock Harbor and Windigo proper. The Windigo campground water source was removed due to low chlorine residual, which can affect water quality. All surface lake and stream water should be considered contaminated with natural parasites. Drinking contaminated water can make you very sick. Water collected in the park should be boiled for at least two minutes, purified, or passed through a 0.4-micron water filter. Chemical treatment is not an effective method of water purification. If you boil your water, bring plenty of stove fuel. If filtering, bring a replacement cartridge for those filters that cannot be cleaned in the field. Precautions should be taken to prevent filters from becoming clogged. Filter water from a pot rather than directly from a lake or creek. Allow the sediment in the pot to settle and filter only from the cleaner water on top.

Dehydration is a problem in hot weather. The Greenstone, Minong, and other trails become hot and dry, and creeks that once offered water may be dry. In addition, there is little or no dependable water available along many trails. To avoid dehydration, be sure to carry a minimum of 2 quarts of water per person. Drink as much water as possible while near water sources. Start hiking early before the day heats up – on ridges it starts getting hot at 10:00 a.m. on sunny days and gets hotter through late afternoon. Hike at a slower pace than usual and rest in shady spots. Watch for early warning signs of dehydration such as thirst, heavy sweating, fatigue, and a red face. Watch for signs of severe dehydration such as reduced or no sweating, headache, long stretches without urinating, dizziness, and nausea.

Virus Watch

The West Nile Virus

This virus has been in the United States since 1999. There have been no reported cases of this virus at Isle Royale National Park. Illness from the virus is rare. Most infections are mild, and symptoms include fever, headache, and body aches, occasionally with skin rash and swollen lymph glands.

Birds are a main source of infection for West Nile Virus. Mosquitoes acquire the virus from biting an infected bird. Infected mosquitoes transmit the Virus to humans while biting. Additional information on the West Nile Virus can be found at www.cdc.gov/ncidod/dvbid/westnile/index.htm.

To minimize risk, wear long-sleeved shirt and long pants outdoors. Apply insect repellents containing DEET up to 35% concentration for adults and 10% for children. Avoid using DEET on children less than two years old. Reduce harmful effects of DEET on the human body by applying it to clothing rather than skin.

Hantavirus

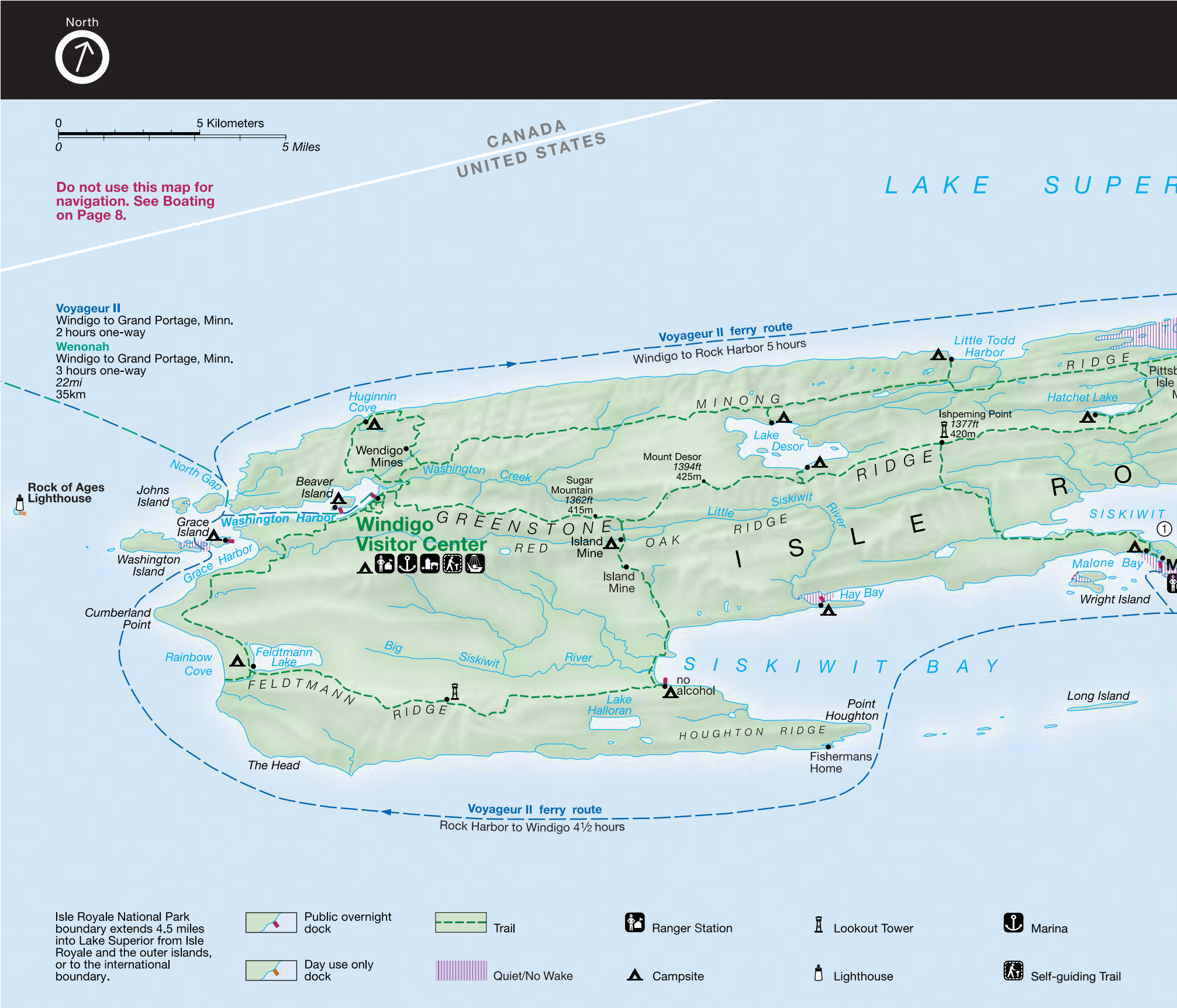
There have been no reported cases of Hantavirus at Isle Royale National Park. Generally, there is a low probability of infection. However, the death rate is very high among infected individuals. The first symptoms are flu-like; the primary symptom is difficulty in breathing and quickly progresses to an inability to breathe.

The deer mouse is the primary carrier of the virus. An infected mouse carries the virus in its urine, saliva, feces, and in the carcass. The primary way humans become infected is through breathing in the virus. Infection can also occur by touching the mouth or nose after handling contaminated materials.

To minimize risk, avoid coming into contact with rodent droppings and burrows, avoid sleeping on bare ground, and store food and garbage in rodent-proof containers. For additional information on Hantavirus contact the Centers for Disease Control and Prevention at 800-532-9929.

Pack It In, Pack It Out

It starts at home. Through careful meal planning and repackaging of food items, you can reduce food leftovers and trash in the backcountry. Please pack out everything you take in. Leftover food, food-scrap, orange peels, nutshells, apple cores, twist-ties, candy wrappers, fishing line, and cigarette butts must be packed out. If you have food leftovers, either save and eat them later or pack them out. Do not burn, bury or place trash, food scraps or garbage in outhouses. Please help keep the backcountry clean by packing out what you packed in.



CAMPGROUNDS

WARNING: Depth at dock. Know your boat's draft.

KEY: CR - Fires in community ring only
S - Self contained stoves only
W - Treated water supply
F - Campfires allowed or standing grills provided
A - No Alcohol

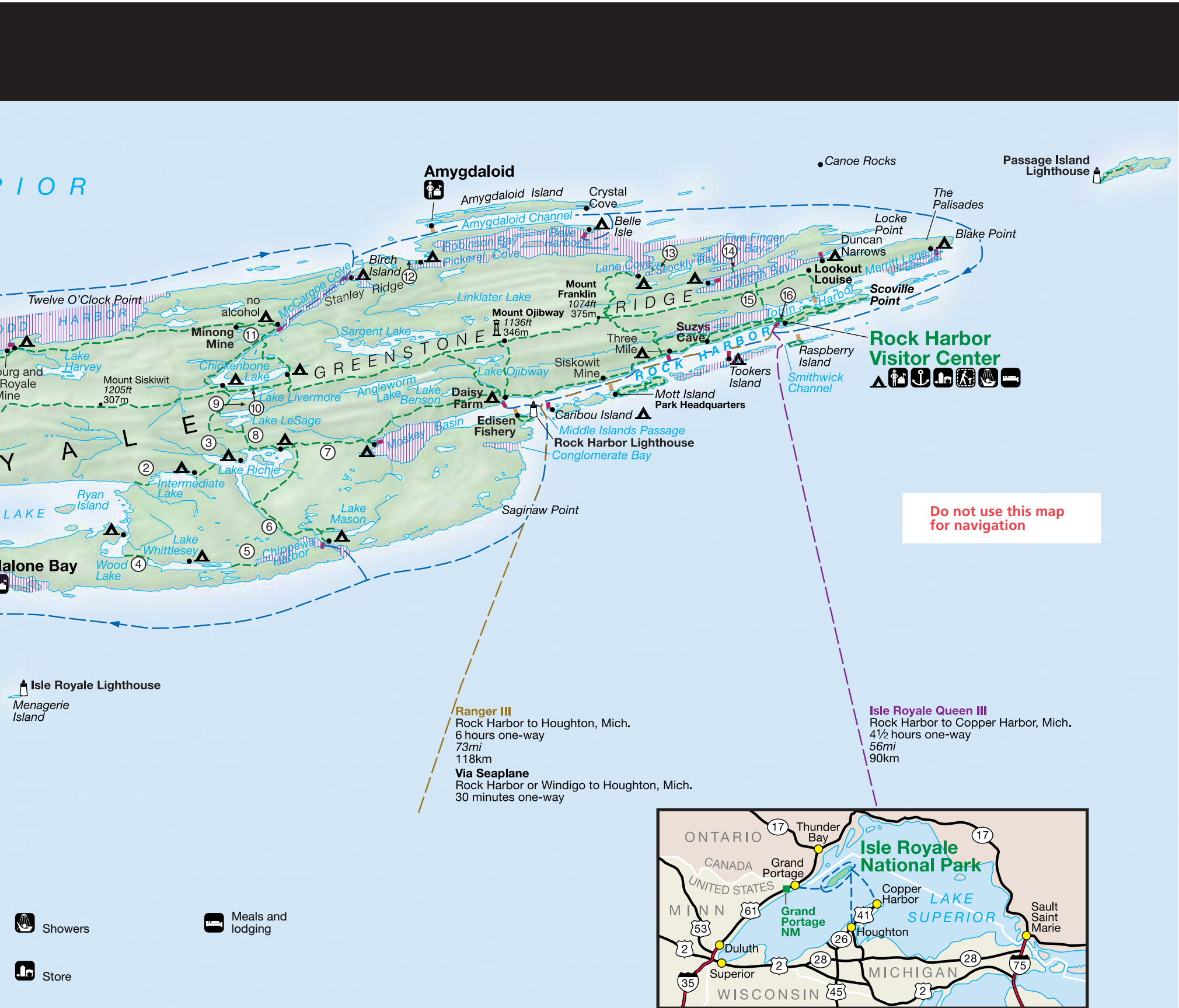
	Consecutive Night's Stay Limit Effective 6/1 - 9/2	Individual Tent Sites	Shelters	Group Tent Sites	Special Information	Approx. Depth at Dock in Feet	On-board Generator Use Permitted*
■ Beaver Island	3	0	3	0	S	2' - 5'	yes
■ Belle Isle	5	1	6	0	F	13'	yes
■ Birch Island	3	1	1	0	S	5'	no
■ Caribou Island	3	1	2	0	CR	10'	yes
■ Chickenbone E.	2	3	0	1	S	-	-
■ Chickenbone W.	2	6	0	3	S	-	-
■ Chippewa Harbor	3	2	4	1	F	7'	no
■ Daisy Farm	3	6	16	3	S	9'	no
■ Desor N.	2	3	0	0	S	-	-
■ Desor S.	2	7	0	3	S	-	-
■ Duncan Bay	3	1	2	0	F	6'	no
■ Duncan Narrows	3	1	2	0	F	6'	no
■ Feldtmann Lake	2	5	0	2	S	-	-
■ Grace Island	3	0	2	0	S	2' - 4'	yes
■ Hatchet Lake	2	5	0	3	S	-	-
■ Hay Bay	3	1	0	0	S	3' - 7'	yes
■ Huginnin Cove	3	5	0	0	S	-	-
■ Intermediate Lake	2	3	0	0	S	-	-
■ Island Mine	3	4	0	2	F	-	-
■ Lake Richie	2	4	0	2	S	-	-
■ Lake Richie/Canoe	2	3	0	0	S	-	-
■ Lake Whittlesey	2	3	0	0	S	-	-
■ Lane Cove	3	5	0	0	S	-	-
■ Little Todd	2	4	0	0	F	-	-
■ Malone Bay	3	0	5	2	F	3' - 6'	yes
■ McCargoe Cove	3	3	6	3	CR-A	7'	no
■ Merritt Lane	3	1	1	0	S	8'	no
■ Moskey Basin	3	2	6	2	S	8'	no
■ Pickerel Cove	2	1	0	0	S	-	-
■ Rock Harbor	1	11	9	3	W-S	-	-
■ Rock Harbor Marina	Unlimited	-	-	-	F	3' - 12'	yes
■ Siskiwit Bay	3	4	2	3	CR-A	2' - 6'	no
■ Three Mile	1	4	8	3	S	9'	no
■ Todd Harbor	3	5	1	3	CR	2'	no
■ Tookers Island	3	0	2	0	S	7'	no
■ Washington Creek	3	5	10	4	S-W	-	-
■ Windigo Dock	5	-	-	-	S	4' - 20'	yes
■ Wood Lake	2	3	0	0	S	-	-

*see Isle Royale Boating Guide for details

CANOE PORTAGES

- Distance•Elevation Change•General Comment
- ① Malone Bay - Siskiwit Lake - .3 miles, 40' Gradual Slope
 - ② Siskiwit Lake - Intermediate Lake - .4 miles, 40' Gradual
 - ③ Intermediate Lake - Lake Richie - .6 miles, 120' Hilly and wooded
 - ④ Wood Lake - Lake Whittlesey - .6 miles, 80' Rolling
 - ⑤ Lake Whittlesey - Chippewa Harbor - .6 miles, 140' Steep grades and rocky
 - ⑥ Chippewa Harbor - Lake Richie - 1.2 miles, 160' Hilly
 - ⑦ Moskey Basin - Lake Richie - 2.0 miles, 120' Gradual but very long
 - ⑧ Lake Richie - Lake LeSage - .6 miles, 100' Steep grades, wet
 - ⑨ Lake LeSage - Lake Livermore - .4 miles, 80' Steep grades, wet
 - ⑩ Lake Livermore - Chickenbone Lake - .2 miles, 40' Steep but short
 - ⑪ Chickenbone Lake -McCargoe Cove - .7 miles, 80' Hilly
 - ⑫ Pickerel Cove - .1 miles, 10' Short and sweet
 - ⑬ Lane Cove - Stockly Bay - .1 mile, 8' Short and sweet
 - ⑭ Five Finger Bay - Duncan Bay - .2 miles, 8' Short and sweet
 - ⑮ Duncan Bay -Tobin Harbor - .8 miles, 175' Extremely steep
 - ⑯ Tobin Harbor - Rock Harbor - .2 miles, 40' Up and over

NOTE: Because of Isle Royale's geology, north-facing slopes are much steeper than south-facing slopes.



MEDICAL + TIPS

- The island’s wilderness and Lake Superior present challenges and potential hazards to the inexperienced or ill-prepared.
- Basic emergency services are available on the island, but contacting rangers for assistance can be difficult. Emergency response and evacuation may take time, requiring you to rely on your own skills and equipment. Most private boaters on Lake Superior have radios and can contact park rangers in an emergency.
- Bring a good first aid kit, a sufficient supply of any needed medications, and clothing appropriate for the time of year.
- Boil or filter all surface water. Drink plenty of water. When dehydrated, you tire more quickly, don’t think clearly, and are more prone to fall.
- **Weather and lake conditions can deteriorate quickly and unexpectedly. Hypothermia can occur any time of the year, especially near Lake Superior, where water and air temperatures are cool to cold year-round. Fog and waves can quickly create dangerous conditions for any boat and especially for paddlers.**
- Many people underestimate hiking travel times and overestimate their abilities. Plan shorter, realistic travel days; don’t turn your wilderness trek into a forced march.

FISHING REGULATIONS

Species	Seasons	Minimum Size	Daily Possession Limit	Comment
Lake Trout, Rainbow Trout and Salmon Lake Superior	April 16 to October 31	10”	5 in any combination, but no more than 3 of any one species	*1 *2
Coaster Brook Trout Lake Superior	May 1 to Labor Day	18”	1	No take is recommended due to rarity of fish
Brook Trout Streams	Last Saturday in April to August 15	7”	2, with no more than one over 12”	Artificial lures only on interior lakes and streams**
Rainbow Trout Streams		7”	5, with no more than 3 fish over 15”	
Yellow Perch Lake Superior and Inland Lakes	April 16 to October 31	No minimum size	50	Recommend daily limit of 10
Northern Pike Lake Superior and Inland Lakes		24”	5 in any combination, but no more than 2 Northern Pike	Artificial lures only on interior lakes and streams**
Walleye Lake Superior and Inland Lakes	May 15 to October 31	15”		
For additional fish species, seasons, and creel limits, please review the Michigan Fishing Guide				
*1 Park boundaries extend 4.5 miles out into Lake Superior from the outermost land areas of the park.				
*2 For additional trout/salmon fishing information, review the Michigan Fishing Guide.				
** Artificial lure means any lure or fly manufactured in imitation of, or as a substitute for natural bait. It is unlawful to use or possess live bait, dead or preserved bait, organic or processed food, or scented material on interior lakes or streams.				

Wilderness Use

Leave What You Find

Enjoy your discoveries and take them home via photographs, drawings, and memories. Natural objects of beauty or interest such as moose antlers, plants, driftwood, cultural or archeological resources, greenstones, agates, datolite and other minerals, including those found in Lake Superior must be left where they are so others can experience the same sense of discovery. Removing, possessing, or disturbing park resources is prohibited. This may seem like a harmless act, but the cumulative effect of many people doing the same can be quite damaging to park resources. Picking small quantities of berries and wild edibles for personal consumption is permitted.

Insects

Expect mosquitoes, black flies, gnats, and other insects to peak in June or July. During wet summers, mosquito populations can continue well into August. Bring insect repellent, netting, or other skin barriers. Refer to page 5, under “Virus Watch” for more details. Make sure your tent’s mosquito netting is in good repair and the zippers work. Dry summers will produce an abundance of yellowjackets. Bring an epinephrine kit if you or a member of your party is allergic to bee stings. For others, over-the-counter antihistamines may help counter minor swelling and itching.

Minimize Use of Fires

Campfires are permitted at only a handful of campgrounds. A backpacking stove is a must; these stoves are lightweight, dependable, easier to use, and less damaging to the park than wood fires. Twig-burning backpacking stoves are permitted. Where campfires are allowed, a metal fire ring is provided; never build your own ring. Gather only dead and down wood away from the camp area. Use small diameter wood no larger than an adult’s wrist, as this will burn completely and will eliminate the need to pack a hatchet or saw. Collect wood from a wide area and away from the immediate vicinity of camp. This keeps the camp area from becoming depleted of wood and potential nutrients. Do not break branches or strip bark from standing trees, live or dead. Resist the temptation to gather driftwood or wood from beaver dams or lodges. The fire should be kept small; massive fires only waste wood. Once finished, make sure the flames and coals are dead out and cold to the touch. Double check that it is out before going to bed or leaving camp.

Canoeing/Kayaking

Lake Superior is well known for its cold temperatures, fog, and sudden squalls that can generate waves that could easily swamp a canoe. This along with scarce outer shore landing sites adds to the potential danger. Small, open vessels are discouraged from entering these cold treacherous waters and are encouraged to use the numerous miles of waterways that the inland lakes provide. Canoeists and kayakers should be familiar with weather patterns and consult the Marine Forecast at ranger stations before embarking. Be prepared to adjust your schedule to the weather. A portable marine radio is recommended.

Portages – Canoe routes and portages are on the northeast half of the Island. Portages are marked with a letter “P” on a 4” x 4” post. **PFD** – Every canoeist and kayaker must have a U.S. Coast Guard approved personal flotation device. Wear it; your life may depend on it. **Boat Rental** – Canoe and motorboat rentals are available at Windigo and Rock Harbor. For more information contact the Rock Harbor Lodge. (refer to page 10).

Loons

Isle Royale National Park is the summer home for over 100 nesting pairs of Common Loons, supporting the only known population which still breeds on Great Lakes waters. These birds nest on land very close to the shoreline, making them highly susceptible to human disturbance. An adult Loon who tremolos (the laughing call) is sending a message that you are too close. A safe viewing distance is 200 yards. Areas in and around Isle Royale may be closed late May through mid-July due to Loon nesting. Please check at the visitor centers for updated information.

Wheeled Vehicles/Devices

Wheeled vehicles (except for wheelchairs) or other mechanical forms of transportation are not allowed on trails. This includes bicycles and portaging devices.

Weapons, Traps, & Nets

The use or possession of weapons, traps, and nets is prohibited. Weapons include any implements designed to discharge a projectile or missile in the air or water. Fireworks are prohibited.

Pets

Dogs, cats, and other pets are not allowed. This includes pets on boats within the park boundaries, which extend 4 1/2 miles into Lake Superior from the outermost land areas of the park. Visitors bringing pets to Isle Royale will be required to leave immediately. Pets disturb wildlife and can transmit diseases, particularly to wolves. Special conditions apply to guide dogs. Please contact the park for further information.

Boating

All boaters staying overnight at anchor, at docks, or in campgrounds must first obtain a camping permit. Lake Superior offers challenging and often dangerous weather in the form of dense fog, high winds, waves, and thunderstorms. Combine this with rocky reefs, limited safe harbors, and Isle Royale’s remoteness, and it pays for you, your crew, and your boat to be shipshape. For additional information on boating and trip planning please request the park’s Isle Royale Boating Guide. In addition to Houghton, Rock Harbor, and Windigo, boaters may obtain Isle Royale camping permits and pay user fees at the U. S. Forest Service Ranger Station in Grand Marais, Minnesota. **Restricted Water Activities** – Water skiing and personal watercraft including vessels commonly referred to as jet skis, waverunners, sea-dos, wet bikes, or surf jets are prohibited. Since all of the park’s inland lakes are located within designated Wilderness, they can only be explored by paddling. Vessels with motors (even if not in use) are prohibited on inland lakes and streams. **Portable Generators, Electronic and Motorized Devices** – Operation of electronic and motorized devices such as stereos, televisions, radios tuned to commercial stations and portable generators is not permitted except in developed and open-water motorized zones. Developed areas include the Windigo and Rock Harbor developed areas, and the Mott Island Headquarters area. Open water motorized zones include Lake Superior waters outside of designated “quiet/no wake waters”.

On-Board Generators – The operation or use of permanently installed (by the boat manufacturer) on-board vessel generators is allowed between 6 a.m. and 10:00 p.m. in developed zones and at the following docks: Beaver Island, Belle Isle, Caribou Island, Grace Island, Hay Bay, Malone Bay, Rock Harbor, and Windigo. On-board generators may not be operated or used at the following public docks: Birch Island, Chippewa Harbor, Daisy Farm, Duncan Bay, Duncan Narrows, McCargoe Cove, Merritt Lane, Moskey Basin, Siskiwit Bay, Three Mile, Todd Harbor, and Tookers Island. Vessels at anchor within Quiet/No Wake Zones may operate on-board generators between 6:00 a.m. and 10:00 p.m., except when anchored within 1/4-mile of a designated park campground. **Quiet/No Wake Zones** – These zones promote a quality visitor experience by providing relatively tranquil, natural marine surroundings. Within the zone, vessels must not exceed 5 mph or create a wake. In flat, calm water, this means not making a wake or traveling no faster than 5 mph. In a one foot sea, a boat could travel up to a speed that would create a one foot wake. Quiet/No Wake Zones include specified areas near Todd Harbor, Johns Island, Barnum/Washington Islands, Hay Bay, Wright Island, Malone Bay, Chippewa Harbor, Conglomerate Bay, Moskey Basin, Lorelei Lane, Tobin Harbor, Merritt Lane, Passage Island, Duncan Bay, Five Finger Bay, Lane Cove, Robinson Bay, Pickerel Cove, Belle Harbor, Crystal Cove, and McCargoe Cove. Consult boater’s maps and brochures available at Park Visitor Centers and on-board the *Ranger III* for specific information. **Alcohol Ban** – Open containers of alcohol are prohibited in campgrounds, on docks, and onboard docked vessels at both Siskiwit Bay and McCargoe Cove. **Pollution Prevention** – Head pump-out service is available at Windigo and Rock Harbor when the concession operation is open. Federal regulations prohibit the discharge of any waste, including gray water, into park waters. Vessels carrying spare fuel in portable containers must use legally approved containers. Fuel may not be stored on docks. **Customs** – All vessels arriving from Canada (U.S. or Canadian) must clear U.S. customs at Windigo or Rock Harbor Ranger Stations. **Divers** – Please refer to your dive permit regulations concerning compressor use. **Fuel** – Gasoline is sold from Mid-June to early September at Windigo; gasoline and diesel fuel are sold from Mid-May to Mid-September at Rock Harbor. Diesel fuel is not available at Windigo. Early and late season service or fuel may be obtained at Windigo and Mott Island if personnel are available.

Greg Blust
Houghton District Interpreter

Fishing at Isle Royale

A Michigan fishing license is required for fishing in Lake Superior, including narrow bays and harbors, and when transporting fish from the island to the mainland. If you are under 17 years of age, you may fish without a license. Licenses are not required to fish on the inland waters of Isle Royale, possession limits are the same as those set by the State of Michigan. Anglers should refer

to the Michigan fishing regulations for possession limits and detailed license requirements for Lake Superior (also see the chart on page 7 for a brief guide to regulations). Only 24-hour licenses are available on the island and only when concession services are open. You may purchase a Michigan fishing license online at www.michigan.gov/dnr.

Fishery Conservation

With its multitude of islands and bays on Lake Superior, as well as several lakes and streams on the interior of the island, Isle Royale provides many opportunities for outstanding recreational fishing for wild, native fish. How can you help to conserve and minimize damage to the Isle Royale fishery?

- Catch only what you plan to keep or eat. Catch and release, while encouraged, can be damaging and very stressful on fish.
- Know the minimum size of fish so that if they are too small they can be quickly released.
- Release larger fish and keep medium size fish to insure future productivity. Larger, more mature fish produce more offspring than smaller fish.
- Instead of killing trophy fish, consider a modern graphite mount produced from a picture of the fish.
- Return fish to the water as soon as possible. While unhooking them, keep fish in the water as much as possible.
- If fishing from shore, try to remove hooks while the fish are in the water; don't drag them up on the bank.
- Try not to handle fish, but if you need to, do so with a wet hand. Release

- handled fish gently by allowing them to swim from your hands rather than throwing them back into the water.
- Do not squeeze the fish or place fingers in the gills, since a torn gill can cause the fish to bleed to death.
- **Remove the hook gently. Pliers work best. Cut the line near the hook if a fish is deeply hooked. A steel hook will decompose in time.**
- Use only artificial lures (required in inland waters) as exotic species can accidentally be introduced by using live bait and live bait are often swallowed deeper resulting in more damage to fish.
- Use single, barbless hooks or bend down the barbs on the hooks. Using larger spoons when fishing for larger fish such as Northern Pike will help prevent catching undersize fish.

Disposal of Fish Remains

At Rock Harbor, please use the fish cleaning station. At other locations, the preferred method is to dump remains chopped up into pieces 4" or less in deep (50' or deeper) water. This reduces the unsightly remains and odors around campgrounds and the unnaturally large gathering of gulls at these sites. At inland

Ruffe Portrait

Common Name: Eurasian Ruffe, River Ruffe, Pope
Species: *Gymnocephalus cernuus*
Status: Alien
Management: Native to central and eastern Europe, first discovered in western Lake Superior in 1986. Ruffe have shown explosive population growth and compete with native fish for food and habitat; therefore, management efforts are directed toward preventing spread
Description: small member of the perch family, olive-brown to golden brown on the back, paler on the sides, with yellowish-white undersides
Size: Adults average 4" to 6" long
Life Span: Female 7 to 11years – Males 3 to 7 years
Habitat: prefers deep water by day and shallow water by night
Feeding Behavior: bottom feeders



lakes where water may be much shallower than 50', clean fish away from campsites and place remains on shore at least 100' away from the campground, between the waterline and the vegetation line. Please do not clean fish directly on docks. Do not throw remains in shallow water near shore or throw remains to gulls.

Transporting Fish to the Mainland

You are allowed only one day's catch in your possession. While the license holder remains on the Island, Michigan Department of Natural Resources (DNR) allows those with DNR permits to ship legally-taken fish on the *Ranger III*, *Isle Royale Queen III*, *Wenonah*, *Voyageur II* and the seaplane. This one-time per year permit covers up to a single day's catch limit. Fish must be claimed when the ferry service arrives at their destination. Permits may be obtained by writing: Department of Natural Resources, 427 U.S. 41 North, Baraga, Michigan 49908-9627 or calling (906) 353-6651.

Fishermen returning on the *Ranger III* must check in their fish with the ship's purser. Fish cannot be transported in coolers on private boats onboard the *Ranger III*.

Fish Consumption Advisory

Contaminants discovered in the Park ecosystem remind us that although Isle Royale is remote, it is part of a global system. Ongoing research in six inland lakes (Sargent, Siskiwit, Eva, Shesheeb, Wagejo, and Angleworm) shows fish with mercury levels exceeding the State of Michigan fish consumption advisories.

For information on fish consumption advisories check with park staff or visit the Michigan Department of Community Health website at: <http://www.michigan.gov/mdch>

Jay Glase, Fishery Biologist, and Larry Kangas, West District Ranger

Isle Royale Institute Undertakes Maritime Study

The Isle Royale Institute (IRI), which offers public educational programs and supports research at Isle Royale National Park, is expanding its research activities by undertaking a maritime study.

The Institute will use underwater robotics to conduct a study of cultural and natural resources in the waters of Isle Royale and other regions in Lake Superior. Studies of the underwater environment will utilize a small Remotely Operated Vehicle (ROV), boats, scuba divers, and water monitoring equipment. A ROV is a small underwater robot equipped with a camera and devices that allow researchers to study the underwater environment while remaining on the surface. Volunteers and IRI program participants will be assisting in this exciting project. The public is welcome to attend the presentations about the study and to participate in one of the project's educational research tours.

Over the past two years, IRI has provided thirty multi-day public educational programs and hosted over five hundred regional expert presentations. IRI will continue its summer programs for people of all ages and skill levels. Partnerships have been and will continue to be an important part of IRI activities. Two new programs will be offered in 2004. The International Wolf Center, Timber Wolf Alliance, and IRI will partner on a special week of camping, concentrating on wolf-moose education. The Isle Royale Natural History



Association will partner with IRI on a service project at Isle Royale National Park. To learn more about the Institute's tours, programs, and other activities visit our website at www.forest.mtu.edu/iri/.

Mark Gleason
Director, Isle Royale Institute

Round Goby Portrait

Common Name: Round goby, Goby
Species: *Neogobius melanostomus*
Status: Alien



Management: First observed St. Clair River in 1990. Today they are found in eastern and southern Lake Erie, southern Lake Huron, southern Lake Michigan, and western Lake Superior. They have access to the Mississippi River via the Grand Calumet River near Chicago. They are aggressive, and compete with native bottom-dwellers like sculpins and log perch by displacing them, eating their eggs and young, taking over optimal habitat, spawning multiple times a season, and surviving in poor quality water. They are expected to be harmful to Great Lakes and inland fisheries; therefore, management efforts are directed to reduction of their populations to protect sport and commercial fishing.
Description: Gobies have large heads, soft bodies, and dorsal fins lacking spines; they slightly resemble large tadpoles. The gobies' unique feature is their fused pelvic fins, which form a suctional disk.
Size: 4" to 10"
Life Span: Average life expectancy is 3 to 5 years.
Habitat: A bottom dweller prefers rock, cobble or riprap, adaptable to a wide range of habitats.
Feeding Behavior: In Europe, their diet consists primarily of clams, mussels, and large invertebrates, but they also eat fish eggs, small fish and insect larvae. In the United States, studies have revealed their diet includes insect larvae and zebra mussels.

Sustainable Commercial Fishing

Isle Royale’s historic commercial fishermen were very interested in maintaining the native fishery resources of Lake Superior. They were biologists of a sort, although they probably would not have called themselves that. From their intimate knowledge of the lake and fish and where they lived, fishermen recognized several different subspecies of lake trout. For example, Ed Holte of Wright Island identified 10 subspecies of lake trout at Isle Royale, each different in their shape, spawning habits, taste, behavior, and preferred habitat type. One lake trout that fishermen noted was the Rock of Ages trout found in the reefs around the Lighthouse.

Commercial fishermen were concerned about fish populations and the propagation of native species. The brook trout stocking in Siskiwit Bay last summer is not the first incidence of fish stocking at Isle Royale. As early as the 1880s, fish were being stocked in

Lake Superior. In 1883, four million white-fish were planted in the lake. By the 1890s, fish were being stocked in Isle Royale waters. S.P. Wires, of the US Fish Commission, reported in 1893 that Isle Royale was stocked with lake trout fry. Fishing pressure was fairly heavy at that time and the population of commercial fish species was a concern. The Assistant Manager of Booth Fish Company in Duluth estimated that 40 fishing boats were operating in Isle Royale waters in 1893, with approximately 100 men engaged in the operation.

The island’s fishermen were heavily involved in efforts to raise lake trout to be put back in Island waters. Many fishermen collected roe and milt and took care of the fertilized eggs until they were sent via boat, like the *America* vessel, to fish hatcheries. The fish were then brought back to the island for stocking. The fishermen were very adamant

that only Isle Royale fish should come back to Isle Royale to continue the viability of the native species. To help with the effort, between 1916 and 1940, fishermen collected and sent 34 million lake trout eggs to be raised in a Duluth hatchery and then returned to the waters around the island. Historical records also show that whitefish eggs were collected and stocked at Isle Royale. In 1932, 3200 seven-month-old brook trout were planted in Tobin Harbor, Rock Harbor, and the Siskiwit River.

In 1946, the sea lamprey, a devastating exotic species, was found in Isle Royale waters. In a short time, the presence of the lamprey decimated the lake trout population. As a result, by the late 1950s, commercial fishing as a viable economic activity collapsed.

Liz Valencia
Branch Chief of Cultural Resources



Fisherman lifts nets from Isle Royale waters

Maintaining a Healthy Lake Ecosystem

Isle Royale’s Maintenance Division strives to minimize environmental impact of facilities and operation in the Park. Docks, trails, and campgrounds are constructed to avoid impacts on natural currents, aquatic life, and the lake bottom. Docks are built with environmentally-friendly treated wood and dock cribs are designed to provide habitat for aquatic life. All dock construction is reviewed and approved by the Army Corp. of Engineers, a sister agency providing expertise to minimize the effect on the natural environment. Campground facilities and trails are constructed to minimize negative impacts of erosion and runoff to the shoreline and aquatic environment.

The park has recently converted all 2-Cycle outboard motors to efficient,

environmentally-friendly 4-stroke outboards. Additionally, Isle Royale has begun a Bio-fluid program to reduce the potential of petroleum pollutants by using soy-based hydraulic fluid, grease, fuels and lubricants. The Park’s close relationship with the Environmental Protection Agency and the United States Coast Guard promotes safe fuel transport and storage. These agencies require operational plans, manuals, and training in spill response, and the deployment of spill containment equipment to protect the environment. A new barge for transporting gasoline to the island will be placed in service in 2004 and is double-hulled for increased environmental safety.

Rick Barrett
Chief of Maintenance



Beaver Island Dock near Windigo serves a boat-in campground



Wright Island Dock in Siskiwit Bay is the site of a historic commercial fishery

Rock Harbor Lodge & Windigo Store

Rock Harbor Lodge offers the only lodging accommodations at Isle Royale National Park. Located along the shore of Lake Superior, the Lodge offers rooms with private baths and housekeeping cottages. We invite you to use Rock Harbor Lodge and its American/European Plan lodging as a base to explore this unique National Park.

Rock Harbor Lodge

The lodge has four buildings composed of 60 American/European Plan rooms located along the shoreline of Rock Harbor at the northeast end of Isle Royale. The lodge is open June 8 through September 10. Each room accommodates four and offers a private bath and picture windows overlooking the harbor and surrounding islands.

Housekeeping Cottages

Twenty duplex housekeeping cottages are located between the Lodge marina and Tobin Harbor. Cottages are open May 28 through September 10. The units accommodate six and are furnished with utensils, dishware, private bath, dressing room, double bed and two bunk beds. Linens, blankets, electric heat and studio-type living area are featured.

Gift Shop and Dockside Store

The Lodge Gift Shop sells a selection of handcrafted gifts, apparel, photo supplies, postcards, souvenir items, daily fishing licenses,

and tackle. The Dockside Store offers standard groceries as well as freeze dried foods, fishing tackle, stove fuel, camping and hiking accessories, boating accessories, showers, laundry facilities, and sundries.

Lodge Dining Room

To satisfy the appetites of visitors, the dining room offers hearty meals, including fresh Lake Superior Lake Trout. The American Plan includes breakfast, lunch, and dinner in the dining room for lodge guests. Housekeeping guests and park visitors are welcome.

Marina and Water Taxi

The Rock Harbor Marina has 450 feet of dock space and accommodates boats up to 65 feet. Electrical and fresh water hook-up with sewage pump-out service, gasoline, and diesel fuel are available. The marina also offers canoe, kayak, and small boat rentals. To assist access into the backcountry, our water taxi can drop off or pick-up island visitors along with their canoes or kayaks at many of the island’s docks.

Sightseeing and Fishing Charters

Get acquainted with Isle Royale by experiencing a sightseeing trip aboard the *M.V. Sandy* tour boat. Visit the Edison Fishery and historic Rock Harbor Lighthouse, cruise to and hike the trails to Lookout Louise, Raspberry Island, Minong Mine and Passage Island. If fishing is more your game, have our

guides take you to the best places to fish Lake Superior waters. The charter boats are fully equipped and fishing tackle is provided.

Windigo

Windigo Store is located at the southwestern end of Isle Royale. The store is open June 8 through September 12, selling groceries, cold sandwiches, camping supplies, stove fuel, daily fishing licenses and tackle, gifts and photo supplies. The marina offers gasoline, pump-out service, plus motorboat and canoe rentals. Showers and laundry facilities are located near the store.

Contact Rock Harbor Lodge for a color brochure and rate schedule.

Summer
P.O. Box 605
Houghton, Michigan 49931-0605
(906) 337-4993

Winter
Isle Royale Resorts
P.O. Box 27
Mammoth Cave, Kentucky 42259-0027
(270) 773-2191

E-mail:
isleroyaleresort@starband.net

Website:
www.isleroyaleresort.com

The cost for utilities on Isle Royale is much higher than on the mainland. A utility surcharge will be added to the cost of all goods and services provided by Rock Harbor Lodge.

Sea Lamprey Portrait

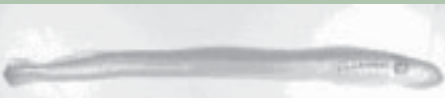


Common Name: Sea Lamprey
Species: *Petromyzon marinus*
Status: Alien
Management: They entered the Great Lakes through the Welland Canal about 1921 and by 1938 they entered Lake Superior. The sea lamprey contributed greatly to the decline of whitefish and lake trout in the Great Lakes, and continue to be actively managed to reduce their populations.

Description: Eel-like, brown or black mottling present dorsally, whitish or gray ventrally. Suctorial mouth with teeth arranged in concentric circles, dorsal fin with notch, pectoral and pelvic fins absent, gill opening represented by 7 small lateral clefts.

Size: 14” to 24” long
Life Span: 5 to 8 years
Habitat: Sedentary stage - Stream sediment
Free swimming stage – lakes and rivers 50° to 55° F

Feeding Behavior: Parasitic on large variety of fishes. They attach using a suctorial mouth which has pointed teeth arranged in concentric circles. Once attached, the lamprey opens wounds on the prey’s skin using a rasping tongue and sharp teeth and feeds on blood and other bodily tissue.



Isle Royale Natural History Association Supports Aquatic Research

The Isle Royale Natural History Association (IRNHA), supports research on Isle Royale with financial grants for researchers and equipment. In 2003, IRNHA contributed over \$1000 to fund a water chemistry study. The study is part of an ongoing zebra mussel threat assessment on the island being conducted by Isle Royale National Park and the Great Lakes Science Center. Thirteen water samples were tested to determine the concentration of the following parameters critical to juvenile zebra mussel development and overall water quality: potassium, sodium, zinc, copper, lead, magnesium, and mercury.

IRNHA is currently seeking funds for another aquatic research project – a two-year survey of aquatic sponges in Isle Royale’s inland lakes.

ISLE ROYALE NATURAL HISTORY ASSOCIATION

The Isle Royale Natural History Association, in partnership with the National Park Service, promotes understanding and appreciation of Isle Royale National Park and Keweenaw National Historical Park through education and research.

By publishing and selling products about Isle Royale National Park and Keweenaw National Historical Park, we not only educate people about these special places, but also raise funds which are re-invested in the parks to support research and interpretive programs.

YOU CAN HELP...

You can support the work of Isle Royale Natural History Association and our partner parks by becoming a contributing member of our organization. Your tax-deductible contribution will help us share the stories of Isle Royale National Park and Keweenaw National Historical Park with people of all ages, around the world. Membership levels are:

- Life \$1000
- Benefactor \$500 (Payable in 5 installments)
- Patron \$250
- Sustaining \$100
- Supporting \$50
- Household \$30
- Individual \$25

IRNHA members receive

- 10% discount on all purchases from IRNHA outlets and other National Park Visitor Centers throughout the U.S.
- 3 issues of the Wolf’s Eye Newsletter
- park newspapers
- invitations to IRNHA programs, trips, and events
- an opportunity to participate in the IRNHA membership e-mail list

Become a member today! Mail the form below, call us at 800-678-6925, or join online at www.irnha.org.

Jill Burkland
Executive Director, Isle Royale Natural History Assoc.

ISLE ROYALE NATURAL HISTORY ASSOCIATION PRODUCTS

Hiking & Canoeing Package**\$24.00**

Includes the Trails Illustrated map, the book Isle Royale National Park: Foot Trails and Water Routes, and the park checklists of birds, mammals, and rocks.

Trails Illustrated Map**\$9.95**

Full park topographic map with visitor information, detailed maps of Rock Harbor and Windigo, and highlighted trails with mileage. Waterproof and tearproof. Folded.

Isle Royale National Park: Foot Trails and Water Routes DuFresne**\$14.95**

The park’s authoritative illustrated guidebook. Contains all the information you need to arrange everything from a series of day hikes to a two-week trek that circles the park. A must for planning your backpacking or canoeing trip to Isle Royale. 136 pages.

Lake Charts**\$18.25**

Official NOAA navigation charts for Isle Royale, Lake Superior, Grand Portage, the Great Lakes, Keweenaw Peninsula and Portge Canal. Soundings in feet. Folded or rolled — add \$3.00 for mailing tube if rolled.

Diaries of an Isle Royale Fisherman Seglem**\$10.95**

Reproductions of the journals and correspondence of Elling Seglem who fished from Isle Royale’s Fisherman’s Home between 1920 and 1932. A photographer during the winter, Seglem was extremely creative in designing and illustrating newspaper-format letters sent home to his family in Chicago. Historic photos and cartoons. 185 pages.

NEW!!! Ecological Study of Wolves on Isle Royale 2003-2004 Peterson**\$3.95**

This year’s report from the winter study on Isle Royale. Includes latest information on the island’s wolf and moose populations. *Annual Reports from 1989-2002 also available.*

Fishes of Isle Royale Lager and Goldman**\$4.95**

This complete fishing guide includes information on the five fish habitats on the Island, a full description of all major species with illustrations, keys to fish identification, and an annotated list of fishes. Charts, maps. 58 pages.

The Geological Story of Isle Royale National Park Huber**\$9.95**

Classic study of Isle Royale’s geological history and landscape, the shifting of rocks and specific minerals which produced one of the most beautiful islands in North America. Maps, photos, and illustrations. 66 pages

The Island Within Us: Isle Royale Artists in Residence Burkland/Root, Editors**Hardcover \$45.95 Paper \$29.95**

Artwork and essays from one of the National Park Service’s longest running Artist in Residence programs. Paintings, photographs, poetry, and more. Full color coffee table book. 165 pages.

Place Names of Isle Royale Parratt and Welker**\$7.95**

The origins, histories, and stories of over 250 Isle Royale locations. A history of Isle Royale in itself. Illustrated with over 50 photographs, drawings and maps, including a complete fold-out map of Isle Royale. 96 pages.

Superior Wilderness: Isle Royale National Park Shelton**\$15.95**

A natural history of Isle Royale for the layperson, emphasizing the ecology of the island, the relationship between its plants, animals and physical environment. Color photographs and an extremely readable text. Maps, photos, charts, illustrations. 171 pages.

The Wildflowers of Isle Royale Janke**\$8.95**

A complete guide to the 101 wildflowers of the island, each with a full written description and a large pen and ink drawing. Index. 96 pages.

Exploring Isle Royale Video/DVD VHS \$17.95 DVD available summer of 2004

Orientation video produced by the National Park Service. Shows how to best enjoy the Island’s many attributes, including its trails, lakes, and campsites. Winner of the 1995 Michigan Outdoor Writers Association Best Outdoor Travel Program. 28 minutes.

Isle Royale Moose T-shirt

100% cotton shirt in natural color with drawing of a bull moose and text “Isle Royale National Park”. Adult S, M, L, XL, **\$16.95** and XXL **\$18.95**

IRNHA MEMBERS RECEIVE A 10% DISCOUNT ON ALL PURCHASES

Visit our sales outlets at Isle Royale National Park Visitor Centers, Houghton, MI and on the island at Rock Harbor and Windigo.

PURCHASES HELP SUPPORT ISLE ROYALE NATIONAL PARK



To order Call **1-800-678-6925**, use the attached order form, or see our website, **www.irnha.org** for a complete listing of IRNHA Publications and Products

Mail Order Form To: Isle Royale Natural History Association, 800 E. Lakeshore Drive, Houghton, MI 49931-1869

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